

Assignment Panel Data

Model for GPP can be stated as follows:

1. Pool Ordinary Least Squares

The model can be stated as:

$$GPP_{it} = \beta_0 + \beta_1 G_{it} + \beta_2 LOAN_{it} + \beta_3 AGRI_{it} + u_{it} \quad (1)$$

where:

GPP_{it} = Gross of provincial product of province i at time t .

G_{it} = Government spending on province i at time t .

$LOAN_{it}$ = Loan outstanding of province i at time t .

$AGRI_{it}$ = Agricultural production of province i at time t .

u_{it} = Disturbance term of province i at time t .

2. Fixed Effect Model

From the above model, we can apply fixed effect model as:

$$GPP_{it} = \beta_{i0} + \beta_1 G_{it} + \beta_2 LOAN_{it} + \beta_3 AGRI_{it} + u_{it} \quad (2)$$

where: β_{i0} = cross-section fixed-effect coefficients

3. Random Effect Model

From the above model, we can apply random effect model as:

$$GPP_{it} = \beta_0 + \beta_1 G_{it} + \beta_2 LOAN_{it} + \beta_3 AGRI_{it} + u_{it} \quad (3)$$

and $u_{it} = v_i + w_t + \varepsilon_{it}$

where: v_i = cross-section random effect

w_t = time random effect

ε_{it} = residual term

From the given data set (assign_panel):

1. Estimate the above three models including Pool Ordinary Least Squares model, Fixed-effect model, and Random-effect model.
2. From the three estimated model, select the most appropriated model, get explanation of the choosing criteria, and make interpretation of the estimated model.